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**ACE-EIA Paper 2/2017**
***For advice on 20 February 2017***

# Environmental Impact Assessment Ordinance (Cap. 499)
# Environmental Impact Assessment Report

## Outlying Islands Sewerage Stage 2 – Upgrading of Tai O Sewage Collection, Treatment and Disposal Facilities

## PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report on the proposed sewerage upgrading works at Tai O (the Project) submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-243/2016). The Drainage Services Department (DSD) (the Applicant) and its consultants will present the EIA report at the meeting of the EIA Subcommittee.

## ADVICE SOUGHT

2. Members' views are sought on the findings and recommendations of the EIA report. The Environmental Protection Department (EPD) will take into account comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under Section 8(3) of the EIAO.

## BACKGROUND

3. The existing Tai O Sewage Treatment Works (STW) is located at the north coast of Tai O. It has a design capacity of 1,220 $m^3$/day at average dry weather flow (ADWF) and provides primary level treatment to sewage collected from the Tai O area. The existing STW was built in the 1980s and its conditions are deteriorating, particularly for the existing submarine outfall where leakages at the joints were identified. The Project will upgrade the STW to secondary level treatment; increase the treatment capacity to 2,750 $m^3$/day at ADWF; and provide a new submarine outfall for discharge

of the treated effluent. The Project will also include construction of two new sewage pumping stations and new sewers to the unsewered areas in Tai O. The Applicant has conducted public engagement exercises to collect views from local communities, Islands District Councilors and green groups during the course of their study on the Project, and has taken these views into account in the EIA study.

4. With respect to the Applicant's submission of the EIA report of the Project for approval, the EPD in conjunction with the relevant authorities, considered that the EIA report met the requirements of the EIA Study Brief and the Technical Memorandum on EIA Process (TM), for the purpose of exhibiting the EIA report for public inspection, under Section 7(4) of the EIAO.

## NEED FOR THE PROJECT

5. Provision of proper sewerage systems to unsewered areas subject to availability of resources is a general Government policy. The proposed sewerage works will extend the village sewerage and provide sewage treatment to meet the existing and projected sewage treatment demand in the Tai O area, with a view to avoiding potential problems arising from ineffective treatment or insufficient maintenance of private septic tank systems. The Project will improve the local hygiene conditions and coastal water quality of Tai O.

6. The existing submarine outfall, with leakages found at some of its joints, currently discharges treated effluent near shore of Tai O. Construction of a new submarine outfall will avoid the potential structural failure problem of the existing outfall, and can cope with the anticipated increase in sewage flow and improve the discharge conditions further offshore.

## DESCRIPTION OF THE PROJECT

7. The Project is to construct and operate a public sewerage system comprising a local sewage treatment plant with effluent reuse facilities, two sewage pumping stations, gravity sewers, rising mains, and a submarine outfall for discharge of treated effluent. The location and general layout of the Project is shown in **Figure 1**. The key components of the Project include :

(i) Expansion and upgrading of Tai O STW to provide secondary level treatment with effluent reuse facilities and a design capacity of 2,750 $m^3$/day at ADWF, and provision of a new submarine outfall of about 130m in length;
(ii) Provision of gravity sewers/twin sewer rising mains of about 5,100m in length in the Tai O area; and,
(iii) Provision of two new sewage pumping stations with design capacity of 350 $m^3$/day and 540 $m^3$/day respectively at ADWF to convey sewage flows.

8. The Project covers the following elements that are Designated Projects (DP) under Part I, Schedule 2 of the EIAO :

(i) Item F.4 – An activity for the reuse of treated sewage effluent from a treatment plant;
(ii) Item F.6 – A submarine sewage outfall; and
(iii) Item Q.1 – A portion of new sewers at Nam Chung Tsuen partly falling within a conservation area.

## ENVIRONMENTAL BENEFITS

9. According to the EIA report, the Project will bring about the following benefits upon its completion :

(i) The advanced technologies adopted for the upgraded sewerage system will enhance the reliability of sewage treatment and safeguard the treated effluent quality; and,

(ii) Public sewers servicing the currently unsewered areas will prevent potential hygiene and water pollution problems arising from the use of private septic tanks.

## CONSIDERATION OF ALTERNATIVE OPTIONS

10. The EIA report has considered alternative options for the development of the Project, including different site locations, plant designs, construction methodologies and programmes, in order to avoid or minimize environmental impacts. The environmental benefits and dis-benefits of the options have been evaluated. The recommended options of various project items have taken into account environmental considerations, site constraints, other factors such as operational requirements, engineering considerations, and comments received from the public engagement exercises during the course of the study. Some of the key approaches that have been adopted by the Applicant to avoid or minimize environmental impacts are summarized below :

### Avoidance of Impacts

(i) Emergency discharge of raw sewage from Tai O STW during equipment or power failure will be avoided by providing standby pump, dual power supply and storm tank; and

(ii) Direct impact on watercourse habitats will be avoided by using trenchless method for sewer works crossing Tai O Creek.

**Minimization of Impacts**

(iii) The footprint of the proposed Tai O STW will be minimized through site selection, and disturbance of ecological sensitive habitats will be minimized by laying mains/sewers along the existing roads/footpaths;

(iv) The optimized length of the new submarine outfall is adopted to minimize the associated environmental impacts during both the construction and operation phases;

(v) Non-dredge reclamation method for sea wall construction is adopted to minimize marine water quality impacts and generation of marine sediments for disposal; and,

(vi) Chemical agent for pavement breaking is adopted to minimize construction noise impact.

## SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

### Water Quality Impact

11. During the construction phase, the main water quality concern is from the dredging works for constructing the new submarine outfall. The EIA report predicts that with the adoption of closed grab dredger and deployment of silt curtains during dredging, no unacceptable adverse water quality impact is anticipated.

12. With the provision of an upgraded STW and public sewers, sewage will be collected and treated to secondary level, and the treated effluent will be discharged through a submarine outfall with diffusers located at around 200m from shores. The EIA report predicts that near shore water quality will be improved as a result.

13. The EIA report concludes that there will not be unacceptable adverse water quality impact during both the construction and operation phases.

### Noise Impact

14. With the adoption of good site practices, use of quiet construction equipment and working methods, mobile noise barriers and proper scheduling of works, construction noise will be mitigated to within the stipulated noise criteria.

15. Operational noise impact arising from the noisy plant and equipment items will be controlled as they will be enclosed inside the STW and sewage pumping station structures.

16. The EIA report concludes that there will not be unacceptable adverse noise impact during both the construction and operation phases.

**Air Quality Impact**

17. During construction, the EIA report predicts that, with good site practices including dust control measures such as water spraying and covering dusty stockpiled materials, the dust levels at representative air sensitive receivers will comply with the stipulated criteria for Total Suspended Particulates, Respirable Suspended Particulates and Fine Suspended Particulates.

18. With the implementation of odour control measures including enclosure of odour emission sources and installation of de-odorization units, the EIA report predicts that the odour impacts arising from the operation of the upgraded STW and the sewage pumping stations are insignificant. The predicted odour levels at all ASRs are well below the odour criterion (5 odour units based on an averaging time of 5 seconds) stipulated in the TM.

19. The EIA report concludes that there will not be unacceptable adverse air quality impact during both the construction and operation phases.

**Ecological Impact**

20. According to the EIA report, the Project will cause a loss of a small area of terrestrial and marine habitat with limited ecological value. No important habitats or species of conservation importance will be lost. Furthermore, a dolphin exclusion zone with dolphin watching plan during marine construction works will be implemented. The EIA report concludes that there will be no unacceptable adverse ecological impact during both the construction and operation phases.

**Other Environmental Impacts**

21. The EIA report considers that the other environmental impacts, including the waste management, land contamination, fisheries, cultural heritage, landscape and visual aspects, are relatively minor. With the implementation of the recommended mitigation measures, the EIA report concludes that the Project will comply with the relevant requirements under the TM.

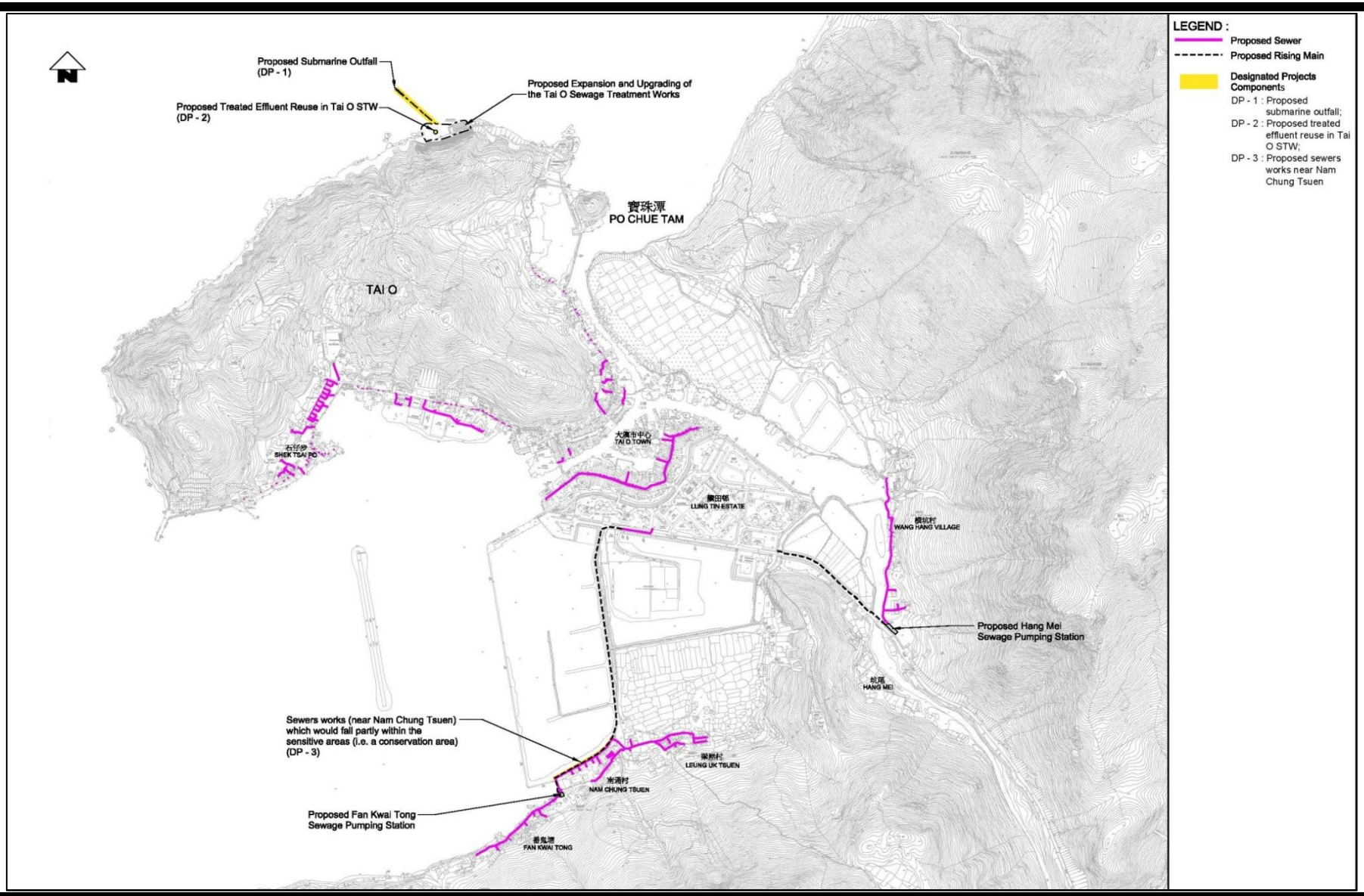
**ENVIRONMENTAL MONITORING AND AUDIT**

22. The Environmental Monitoring and Audit (EM&A) Manual included in the EIA report recommends an EM&A programme for the construction and operation phases of the Project. Key recommended EM&A requirements cover air quality, noise and water quality.

**PUBLIC CONSULTATION**

23. The Applicant made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 29 November 2016 to 28 December 2016. During the period, one public comment was received by the EPD. The public comment requests the Applicant to brief the Tai O Rural Committee regarding the details of the works in due course, but raises no environmental concerns.

**February 2017**
**Environmental Assessment Division**
**Environmental Protection Department**




**Project Title: Outlying Islands Sewerage Stage 2 – Upgrading of Tai O Sewage Collection, Treatment and Disposal Facilities**
**Figure 1: Project Location Plan**

**Application No. : EIA-243/2016**
[Note: This figure is extracted from the EIA Report – ES (Figure 2.1)]